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SERIAL NUMBER	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
08/165,737	12/10/93	KRUG	K 03375003002

EXAMINER: HUNTLEY,D

ART UNIT: 2311 | PAPER NUMBER: 10

23M1/0119

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DATE MAILED: 01/19/95

This is a communication from the examiner in charge of your application.
COMMISSIONER OF PATENTS AND TRADEMARKS

☐ This application has been examined ☒ Responsive to communication filed on 10/11/94 ☐ This action is made final.

A shortened statutory period for response to this action is set to expire 3 month(s), 0 days from the date of this letter. Failure to respond within the period for response will cause the application to become abandoned. 35 U.S.C. 133

Part I THE FOLLOWING ATTACHMENT(S) ARE PART OF THIS ACTION:

1. ☒ Notice of References Cited by Examiner, PTO-892.
2. ☐ Notice of Draftsman's Patent Drawing Review, PTO-948.
3. ☒ Notice of Art Cited by Applicant, PTO-1449.
4. ☐ Notice of Informal Patent Application, PTO-152.
5. ☐ Information on How to Effect Drawing Changes, PTO-1474.
6. ☐ _____.

Part II SUMMARY OF ACTION

1. ☒ Claims 57-59 and 61-81 are pending in the application.

   Of the above, claims _____ are withdrawn from consideration.

2. ☒ Claims 1-56 and 60 have been cancelled.
3. ☐ Claims _____ are allowed.
4. ☒ Claims 57-59 and 61-81 are rejected.
5. ☐ Claims _____ are objected to.
6. ☐ Claims _____ are subject to restriction or election requirement.
7. ☐ This application has been filed with informal drawings under 37 C.F.R. 1.85 which are acceptable for examination purposes.
8. ☐ Formal drawings are required in response to this Office action.
9. ☐ The corrected or substitute drawings have been received on _____. Under 37 C.F.R. 1.84 these drawings are ☐ acceptable; ☐ not acceptable (see explanation or Notice of Draftsman's Patent Drawing Review, PTO-948).
10. ☐ The proposed additional or substitute sheet(s) of drawings, filed on _____. has (have) been ☐ approved by the examiner; ☐ disapproved by the examiner (see explanation).
11. ☐ The proposed drawing correction, filed _____, has been ☐ approved; ☐ disapproved (see explanation).
12. ☐ Acknowledgement is made of the claim for priority under 35 U.S.C. 119. The certified copy has ☐ been received ☐ not been received ☐ been filed in parent application, serial no. _____; filed on _____.
13. ☐ Since this application apppears to be in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under Ex parte Quayle, 1935 C.D. 11; 453 O.G. 213.
14. ☐ Other

EXAMINER'S ACTION

1. The following correspondence is in response to the amendment submitted on 10-11-94.

2. The arguments presented in the 10-11-94 response are moot in view of the new grounds of rejection. The delay is prosecution is regretted.

3. Claims 57-59 and 61-81 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

a) Claim 57, line 5, line 7; claim 69, line 6, line 8; claim 71, line 5, line 7, line 10, line 19, line 26; claim 74, line 2; claim 79, line 3; line 81, line 2, line 3: the phrase "adapted to" is functional and vague. See MPEP 706.03(c) and *In re Hutchinson*, 69 USPQ 138.

b) Claim 57, line 13: "said region" has vague antecedent basis, as the claim previously mentions several regions.

c) Claim 57, line 18: should "overlying material to said value" read -- overlying material to said target material -- ?

d) Claim 58, lines 3-4: the phrase "the steepness of the gradient of the value of said property adjacent the target region" is vague. Does this passage make reference to the magnitude of the gradient in a region which is adjacent to the target region?

e) Claim 61, line 2; claim 75, line 2: it is not clear what applicant wants to convey with the word "effectively". Also, the

claim as a whole fails to recite in what manner the look-up table is used.

f) Claim 65, line 3: the metes and bounds of the phrase "a similar article" is not clear. Note *Ex parte Caldwell*, 1906 CD 58: "coke, brick or like material" held to be indefinite.

g) Claim 65, line 3; claim 69, line 2: the phrase "capable of" refers to the *potential* of the device to function in a prescribed manner. That the device merely *could* function in a certain manner leaves in doubt whether the claim actually encompasses such a function.

h) Claims 59, 62-64, 66-68, 70, 72, 76-78 and 80 incorporate the deficiencies of the claims they depend on and are rejected for this reason.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. § 103, the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 C.F.R. § 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of potential 35 U.S.C. § 102(f) or (g) prior art under 35 U.S.C. § 103.

The following is a quotation of 35 U.S.C. § 103 which forms the basis for all obviousness rejections set forth in this Office action:

> A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

> Subject matter developed by another person, which qualifies as prior art only under subsection (f) or (g) of section 102 of this title, shall not preclude patentability under this section where the subject matter and the claimed invention were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person.

Claims 57-59 and 61-81 are rejected under 35 U.S.C. § 103 as being unpatentable over Doenges 4,987,584 in view of Macovski 3,848,130.

As to claim 57, Doenges teaches a method for detecting a specific given material that may be present in an ensemble of objects, including the steps of exposing regions of the ensemble to dual energy x-rays from source (1a), and measuring the dual energy x-ray intensity which passes through the ensemble and impinges on linear detector (col. 2, line 30). The specific materials in the ensemble are determined by taking a ratio of the dual energy x-ray data transmitted through the ensemble (col. 2, lines 43-48). The presence of given materials are determined by reference to a look-up table (col. 3, lines 52-55). The presence of given materials are illustrated by highlighting the structures on a video display (11b, 11a, col. 3, lines 52-67).

Claim 57 specifically recites that the property of the suspect material is determined by removing "contribution of the underlying or overlying material" which, in turn, is determined by "regions adjacent to regions under consideration". Examiner submits that, because different materials absorb the dual energy x-rays in different capacities, Doenges implicitly removes the

effects of overlying and underlying materials in his processing. However, more to the point is Macovski, which shows separating overlapping materials Z1, Z2 and Z3 in an ensemble (27, 28) by using multi-energy x-rays and a look-up table (cols. 6-7). It would have been obvious to separate materials in the manner taught by Macovski in order to better highlight dangerous materials which are obfuscated by underlying or overlying materials. The phrase "regions adjacent to regions under consideration" can be reasonably interpreted as regions which underlie or overlie the target region, as they are "adjacent" these regions.

Claim 58 can not be responded to in full due to the ambiguity of the claim, as addressed in section no. 3 above. However, edge determination to assist in distinguishing between foreground and background is old and well known in the art (col. 3, lines 42-45 of Doenges).

As to claim 59, Doenges highlights on a video display (col. 3).

As to claim 61-62, both Doenges and Macovski use look-up tables. Furthermore, in Macovski the parameters in the look-up table can be empirically determined with test objects (col. 6, line 63). It is old and well known to perform such empirical testing at a variety of thicknesses (col. 7 of Alvarez, 4,029,963, for example).

As to claim 63, see (11a, 11b) of Doenges.

As to claim 64, Doenges uses an x-ray fan-beam source (col. 2, line 16).

As to claim 65, Doenges uses a conveyer (3a), col. 2, line 18.

As to claim 66, Doenges uses a linear detector (col. 2, line 30).

As to claim 67, Doenges and Macovski use dual energy sources.

As to claim 68, processing and displaying information from different materials in effect results in the recited "comparing".

As to claim 70, conventional dual-energy x-ray imaging involves computation of the logarithms of the attenuation data, and examiner makes Official Notice of such.

Claims 69 and 71-81 substantially repeat the same subject matter and are therefore rejected for reasons given above.

5. Claims 57-59 and 61-81 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-63 of U.S. Patent No. 5,319,547 in view of Doenges 4,987,584.

In the following, the subscript "P" refers to claims from the patents, while the subscript "A" refers to claims from the application.

As to claim 57_A, claim 48_P recites a method for detecting a given material in an ensemble of objects including a step of exposing regions to x-ray ration, detecting radiation passing

through the object, and determining a property of an unknown target by sampling the attenuation data at a target region, and a nearby neighboring background region. Claim 52_P recites a step of comparing the property of the target region with a previously determined property of the given material. Claim 50_P recites a step of registering locations of suspect materials and highlighting the material on a display.

The claims of the patent do not recite a stationary x-ray source and detector, but this is conventional in the art, as exemplified by Doenges, in figure 1 and col. 2. It would have been obvious to use a stationary source and detector, as opposed to a CAT scan type of machine, in order to simplify the design and reduce cost.

Features from different claims of the patent were excerpted to meet the limitations of claim 57_A. However, one having ordinary skill in the art would understand the claims of the patent to recite one integral system; recombining features from different claims does not create a patentable distinction over the original claims.

As to claim 58_A, claim 53_P recites a step of using a gradient operator to select a target region.

As to claim 59_A, claim 50_P recites a step of registering locations of suspect materials and highlighting the material on a display.

As to claim 61_A-62_A, claim 52_P recites the use of look-up table.

As to claim 63_A, the displaying step of claim 50_P implies the use of a video display monitor.

As to claim 64_A-66_A, Doenges teaches a fan beam of x-rays for irradiating luggage (col. 2, line 19). The detector is a linear array of detectors (col. 2, line 30). It would have been obvious to include a fan beam source, as compared to a pencil beam source, for instance, in order to more quickly scan the object.

As to claim 67_A, claim 48_P recites using dual energy x-rays.

As to claim 68_A, claim 48_P recites collecting attenuation data from background regions which neighbor the target region.

As to claim 70_A, claim 9_P recites forming logarithms.

The remainder of the claims 69_A and 71_A-81_A substantially repeat subject addressed above and are therefore rejected for reasons given above.

6. The obviousness-type double patenting rejection is a judicially established doctrine based upon public policy and is primarily intended to prevent prolongation of the patent term by prohibiting claims in a second patent not patentably distinct from claims in a first patent. *In re Vogel*, 164 USPQ 619 (CCPA 1970). A timely filed terminal disclaimer in compliance with 37 C.F.R. § 1.321(b) would overcome an actual or provisional rejection on this ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 C.F.R. § 1.78(d).

7. The cited but not applied art is considered relevant to applicant's disclosure. Takahashi teaches making an outline of a

bomb or firearm in an ensemble (col. 3, lines 44-52). Doi teaches background subtraction (figure 3, column 6) and edge detection.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to David Huntley whose telephone number is (703) 305-9775.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (703) 305-3800.

dh/1-4-94

DAVID M. HUNTLEY
PRIMARY EXAMINER
GROUP 2300